Trend Study 25C-21-98

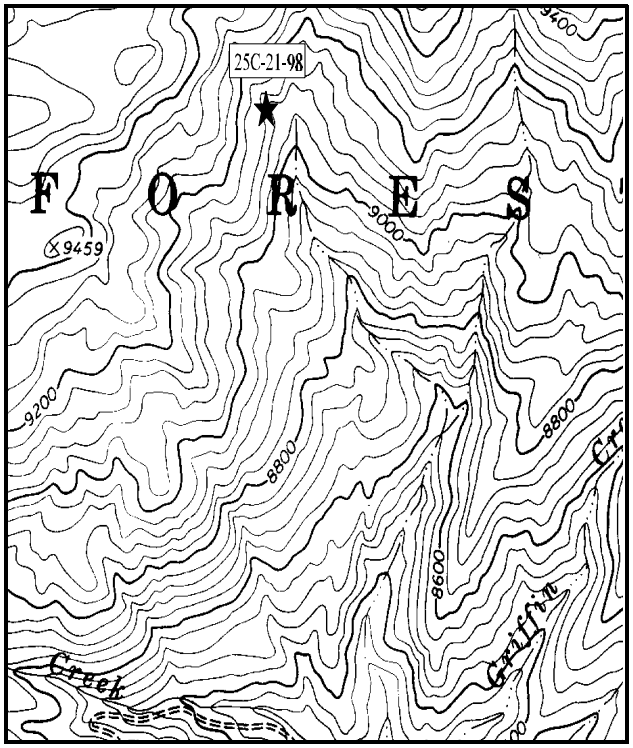
Study site name: Griffin . Range type: Quaking Aspen .

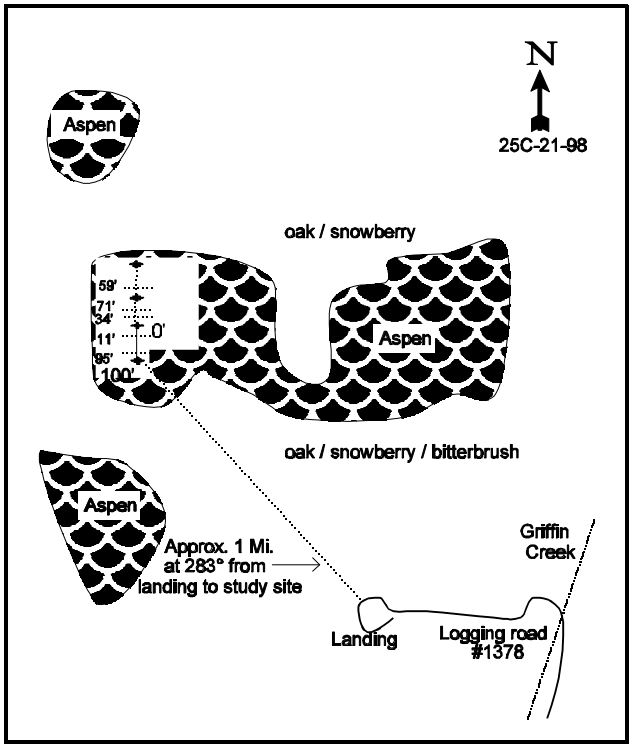
Compass bearing: frequency baseline 180 degrees.

Footmark (first frame at) 5 feet, footmarks (frequency belts) line 1 (11 & 95ft), line 2 (34 &71ft), line 3 (59ft).

LOCATION DESCRIPTION

Drive up the North Creek Road (west of Escalante off SR12) past the reservoir to a major fork. Bear left toward Barker Reservoir and go 2.8 miles. Take the right fork, a dead end logging road #1378. Drive to the end of the road, about 2.3 miles. From here the study is approximately 1/2 mile to the northwest (283°M) in an aspen grove. Walk northwest to the creek, and then hike up the creek to a very large rock about 40-feet wide by 20-feet tall. This is the only rock this big in the area and the creek runs right by it. This rock is about 300 yards from the road. When you find the rock leave the creek and hike southwest up the hill to a small, level bench with bitterbrush and oak on it (about 100 yards). This bench is about the same elevation as when you parked the truck. From this small bench, find the drainage gully and walk up the bottom of it through one small patch of quaking aspen. Keep walking up this drainage to the second patch of aspen which is very big and has a lone Rocky Mountain juniper growing just before it. The transect is just inside this large aspen patch about 100 feet. All stakes are short metal fence posts and the 0-foot stake is marked by browse tag #7169.





Map Name: Barker Reservoir Diagrammatic Sketch

Township 33S , Range 1E , Section Unsurveyed UTM 4198258.004 N, 430002.946 E

DISCUSSION

Trend Study No. 25C-21 (44-21)

Griffin, the second trend study in the aspen type, is located in the upper part of the North Creek drainage. The hillside where the transect is located is approximately one-half mile from the nearest road. It is on a moderate to steep slope, down to the intermittent drainage in the bottom. Aspect is generally southeast with an elevation of 9,200 feet. The area is thought to be used mostly by deer and to a lesser degree by elk during the summer. Pellet group quadrat frequency data from 1994 shows that elk used the area more than deer. Data from 1998 found no sign of elk and estimated only 2 deer days use/acre. Cattle were in the area on the date of study establishment in 1987 and in 1998. Twelve cow days use/acre was estimated in 1998. This area is on a 3 pasture deferred rotation grazing allotment with use occurring from June 6 to September 30.

Typical of high elevation aspen sites, the soil is deep, dark colored, and rich in organic matter. Effective rooting depth (see methods) is estimated at just over 16 inches. Texture is a sandy clay loam with a pH of 5.5 which is strongly to moderately acidic. The soil has a high percentage of organic matter incorporated in the surface horizon and litter cover is nearly continuous. There are scattered large rocks and boulders on the surface. Erosion is minimal.

This site would be characterized as a mature aspen stand. Mature trees average 80-100 feet in height with a large number of fallen trees. The aspen at this site nearly have a continuous canopy cover which could limit understory development and productivity. Shrub size and herbaceous production is much higher near the edge of the aspen. Density plots in 1987 estimated the population to be 1,932 trees/acre with 55% as young trees. The population in 1991 was down to 1,133 trees/acre with 35% of those young. The young and available trees displayed moderate to heavy hedging in 1987 and only light hedging in 1991. Aspen was mistakenly not counted in the shrub density strips in 1994, but point quarter data estimated the population at 331 trees/acre with an average basal diameter of 8.7 inches. Density of aspen increased to 3,520 plants/acre by 1998 due to an increase in young trees. This is partly due to the much larger sample used in 1998 which better estimates shrub and tree densities. The larger sample also included aspen near the edge of the clone which had a higher density of young trees. Several mature trees appear to have been blown down along the north edge of the aspen clone. Utilization in 1998 was mostly light, although some young available plants displayed moderate to heavy use.

Snowberry is numerous in the understory, totaling 6,200 plants/acre in 1987, then 9,799 in 1991, and 8,580 by 1994. Density was lower at 6,280 plants/acre by 1998. Mature plants are relatively small averaging only 12 inches in height in 1998. Utilization was moderate in 1987, but light in other years. Other woody species include: small numbers of Wood's rose, Oregon grape, wax current, white fir, and Gambel oak.

Herbaceous vegetation is the important forage resource on this range type, however the thick aspen canopy limit's growth of the understory. Obtuse sedge is the most abundant species, as it currently provides 53% of the grass cover. Other fairly abundant grasses include Kentucky bluegrass and mutton bluegrass. Production of grasses is low with only 10% cover produced in 1994 and 11% in 1998. Forbs are rare. All species combined produced only 2% cover in 1994 and 3% in 1998. The only fairly abundant species include: thistle, silvery lupine, and American vetch.

1991 TREND ASSESSMENT

Vegetational basal cover was low before, but is even lower now at only 1%. Litter cover is now up to 98%, while percent bare ground is down to only 1%. Soil trend however, is stable for this site due to the abundance of protective ground cover. The most utilized browse species are limited to aspen and snowberry. The aspen population has decreased by 41%, down to 1,133 plants/acre. The young age class has declined from 55% down to 21% of the population. Snowberry have actually increased by 37% to a population of 9,799

plants/acre. The young age class have also gone down from 61% to 42%. Overall, the trend is stable, but trend for aspen should be watched carefully. The grasses are much more common than the forbs. The sum of nested frequency for grasses is up slightly while frequency of forbs has remained stable. Trend would be slightly improving.

TREND ASSESSMENT
soil - stable
browse - stable
herbaceous understory - slightly improving

1994 TREND ASSESSMENT

Ground cover characteristics are similar to those of 1991. Total protective ground cover is excellent at 98% with erosion not being a problem on this site. Trend for soil is stable. The key browse species on the site include aspen and snowberry. Since aspen was mistakenly not included in the shrub density strips in 1994, no comparisons can be made with data from 1991. However, point quarter data estimated 331 trees/acre which is likely a more accurate figure. All the trees sampled with the point quarter were mature trees and the aspen canopy is nearly continuous. Snowberry has an estimated density of 8,580 plants/acre. However, only 22% of the population consists of young plants and no seedlings were encountered. Wood's rose is still declining in numbers and no seedlings or young were found in 1994. The trend for browse is slightly down at this time. The herbaceous understory of this site is dominated by increaser grasses and forbs similar to the Baldy's study (25C-20). Sum of nested frequency for grasses and forbs are about half that of study #20, but they have increased since 1991, indicating a slightly upward trend. However, the composition is still poor. Thinning of the aspen would stimulate better understory growth on this site.

TREND ASSESSMENT
soil - stable
browse - down slightly for snowberry and Wood's rose
herbaceous understory - slightly improved

1998 TREND ASSESSMENT

Trend for soil continues to be stable with abundant protective ground cover. Trend for browse is stable. Density of snowberry has declined 27%, but due to the lack of decadent and dead plants this change is most likely due to the difficulty differentiating individual plants of this sprouting shrub. Density of aspen increased due to the larger sample used in 1998 which gives a better estimate of shrubs and trees. The new sample also sampled some aspen near the clone edge which had a higher density of young trees. Aspen currently has excellent reproduction, mostly light utilization, good vigor, and low decadence. However, the thick stand is suppressing the herbaceous understory production. Trend for the herbaceous understory is stable. Sum of nested frequency of grasses and forbs has remained similar to 1994 estimates. Composition is still poor.

TREND ASSESSMENT
soil - stable
browse - stable
herbaceous understory - stable, but composition poor

HERBACEOUS TRENDS --
Herd unit 25C, Study no: 21

Type	Species	Nested Frequency				Quadrat Frequency				Average Cover %	
		'87	'91	'94	'98	'87	'91	'94	'98	'94	'98
G	Agropyron trachycaulum	$_{a}$-	$_{ab}$5	$_{a}$11	$_{ab}$4	-	3	4	2	.49	.01
G	Bromus carinatus	4	3	2	10	1	1	1	3	.03	.22
G	Carex obtusata	$_{ab}$239	$_{b}$258	$_{a}$210	$_{a}$195	87	92	78	77	4.45	5.32
G	Poa fendleriana	31	42	38	58	13	20	15	24	.49	1.25
G	Poa pratensis	$_{a}$81	$_{ab}$100	$_{b}$120	$_{a}$78	32	39	50	30	3.11	2.20
G	Sitanion hystrix	$_{a}$27	$_{a}$19	$_{ab}$46	$_{b}$67	14	11	19	31	.78	.90
G	Stipa columbiana	1	-	3	3	1	-	3	1	.09	.00
G	Stipa lettermani	$_{a}$-	$_{b}$10	$_{b}$12	$_{ab}$6	-	4	6	3	.06	.04
Total Annual Grasses		0	0	0	0	0	0	0	0	0	0
Total Perennial Grasses		383	437	442	421	148	170	176	171	9.50	9.97
F	Agoseris glauca	-	-	-	1	-	-	-	1	-	.03
F	Antennaria parvifolia	-	6	3	-	-	3	2	-	.18	-
F	Chenopodium album (a)	-	-	6	7	-	-	4	3	.02	.01
F	Cirsium wheeleri	$_{a}$3	$_{a}$2	$_{b}$25	$_{b}$32	2	1	11	15	.18	.52
F	Corallorhiza spp.	-	1	-	-	-	1	-	-	-	-
F	Descurainia pinnata (a)	$_{a}$-	$_{ab}$1	$_{ab}$3	$_{b}$17	-	1	2	6	.01	.13
F	Epilobium paniculatum (a)	-	-	-	3	-	-	-	1	-	.00
F	Erigeron eatonii	-	-	-	1	-	-	-	1	-	.03
F	Lupinus argenteus	$_{a}$-	$_{a}$1	$_{b}$31	$_{b}$35	-	1	12	16	1.03	1.57
F	Lychnis drummondii	-	-	-	-	-	-	-	-	.00	-
F	Osmorhiza occidentalis	4	4	5	9	2	2	4	4	.04	.19
F	Penstemon spp.	3	-	6	-	1	-	2	-	.01	-
F	Polygonum douglasii (a)	-	-	4	15	-	-	2	7	.01	.06
F	Senecio spp.	-	-	-	3	-	-	-	1	-	.01
F	Taraxacum officinale	$_{b}$8	$_{ab}$3	$_{b}$6	$_{a}$-	4	1	4	-	.02	-
F	Tragopogon dubius	-	-	-	3	-	-	-	1	-	.00
F	Unknown forb-perennial	-	1	-	-	-	1	-	-	-	-
F	Vicia americana	$_{a}$-	$_{a}$-	$_{b}$29	$_{b}$20	-	-	10	7	.34	.69
Total Annual Forbs		0	1	13	42	0	1	8	17	0.04	0.20
Total Perennial Forbs		18	18	105	104	9	10	45	46	1.82	3.07

Values with different subscript letters are significantly different at % = 0.10

BROWSE TRENDS --
Herd unit 25C, Study no: 21

Type	Species	Strip Frequency '94	Strip Frequency '98	Average Cover % '94	Average Cover % '98
B	Abies concolor	0	0	-	-
B	Amelanchier alnifolia	0	0	-	-
B	Chrysothamnus nauseosus	1	0	-	-
B	Mahonia repens	8	3	.18	.03
B	Pinus ponderosa	0	0	-	-
B	Populus tremuloides	0	66	4.43	4.46
B	Pseudotsuga menziesii	0	1	.03	.41
B	Quercus gambelii	0	0	-	-
B	Ribes spp.	1	2	-	.00
B	Rosa woodsii	1	3	-	.00
B	Symphoricarpos oreophilus	90	86	4.84	6.97
Total for Browse		101	161	9.50	11.89

CANOPY COVER --
Herd unit 25C, Study no: 21

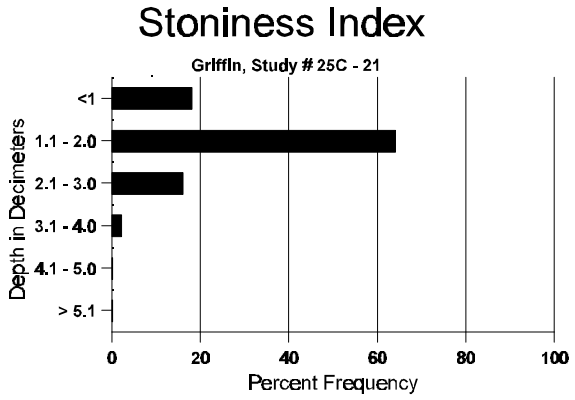
Species	Percent Cover '98
Populus tremuloides	63

BASIC COVER --
Herd unit 25C, Study no: 21

Cover Type	Nested Frequency '94	Nested Frequency '98	Average Cover % '87	'91	'94	'98
Vegetation	310	311	2.00	1.25	17.65	32.32
Rock	18	46	.25	.25	.51	5.83
Pavement	-	7	0	0	0	.18
Litter	398	395	94.50	98.00	77.08	85.17
Cryptogams	2	5	0	0	.00	.03
Bare Ground	21	44	3.25	.50	1.52	1.69

SOIL ANALYSIS DATA --
Herd Unit 25C, Study # 21, Study Name: Griffin

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
16.2	56.5 (16.1)	5.5	56.0	21.4	22.6	4.4	40.7	345.6	.6



PELLET GROUP FREQUENCY --
Herd unit 25C, Study no: 21

Type	Quadrat Frequency '94	'98
Elk	5	-
Deer	1	2
Cattle	1	-

BROWSE CHARACTERISTICS --
Herd unit 25C, Study no: 21

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Abies concolor																		
Y	87	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'87	00%	00%	00%
'91	00%	00%	00%
'94	00%	00%	00%
'98	00%	00%	00%

%Change

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	66	Dec:	-
	'91	0		-
	'94	0		-
	'98	0		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Amelanchier alnifolia																		
Y	87	3	-	-	-	-	-	-	-	-	3	-	-	-	200			3
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'91	00%	00%	00%	
'94	00%	00%	00%	
'98	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'87	200	Dec:		-
'91	0			-
'94	0			-
'98	0			-

Chrysothamnus nauseosus																		
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	1	-	-	-	-	-	-	-	-	1	-	-	-	20	13	7	1
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'91	00%	00%	00%	
'94	00%	00%	00%	
'98	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			
'87	0	Dec:	-
'91	0		-
'94	20		-
'98	0		-

Mahonia repens																		
S	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	91	2	-	-	-	-	-	-	-	-	2	-	-	-	133			2
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	98	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
Y	87	12	-	-	-	-	-	-	-	-	7	-	5	-	800			12
	91	8	-	-	-	-	-	-	-	-	8	-	-	-	533			8
	94	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	98	4	-	-	-	-	-	-	-	-	4	-	-	-	80			4
M	87	1	-	-	-	-	-	-	-	-	1	-	-	-	66	7	5	1
	91	3	-	-	-	-	-	-	-	-	3	-	-	-	200	4	7	3
	94	39	-	-	-	-	-	-	-	-	39	-	-	-	780	3	5	39
	98	9	-	-	-	-	-	-	-	-	9	-	-	-	180	7	11	9

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	38%	-15%
'91	00%	00%	00%	+ 8%
'94	00%	00%	00%	-68%
'98	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			
'87	866	Dec:	-
'91	733		-
'94	800		-
'98	260		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Pinus ponderosa																		
S	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	98	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'91	00%	00%	00%	
'94	00%	00%	00%	
'98	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)					
	'87	0	Dec:		-
	'91	0			-
	'94	0			-
	'98	0			-

Populus tremuloides																		
S	87	9	2	-	-	-	-	-	-	-	11	-	-	-	733			11
	91	10	1	1	-	-	-	-	-	-	12	-	-	-	800			12
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	98	83	-	-	2	-	-	-	-	-	85	-	-	-	1700			85
Y	87	5	7	4	-	-	-	-	-	-	16	-	-	-	1066			16
	91	5	-	-	-	-	-	1	-	-	3	3	-	-	400			6
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	98	124	6	11	-	-	-	-	-	-	141	-	-	-	2820			141
M	87	-	-	-	-	-	-	-	13	-	13	-	-	-	866	393	100	13
	91	-	-	-	-	-	-	-	11	-	11	-	-	-	733	393	143	11
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	98	4	-	-	-	-	-	-	30	-	34	-	-	-	680	-	-	34
D	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	98	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
X	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	300			15

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	24%	14%	00%	-41%
'91	00%	00%	00%	
'94	00%	00%	00%	
'98	03%	06%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	1932	Dec:	0%
	'91	1133		0%
	'94	0		0%
	'98	3520		1%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Pseudotsuga menziesii																		
S	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	98	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
Y	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	91	-	1	-	-	-	-	-	-	-	1	-	-	-	66			1
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	98	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'91	100%	00%	00%	
'94	00%	00%	00%	
'98	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'87	0	Dec:		-
'91	66			-
'94	0			-
'98	20			-

Quercus gambelii																		
S	87	-	1	-	-	-	-	-	-	-	1	-	-	-	66			1
	91	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'91	00%	00%	00%	
'94	00%	00%	00%	
'98	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'87	0	Dec:		-
'91	0			-
'94	0			-
'98	0			-

Ribes spp.																		
Y	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	98	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	1	-	-	-	-	-	-	-	-	1	-	-	-	20	5	6	1
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	00%	00%	00%	
'91	00%	00%	00%	
'94	00%	00%	00%	+67%
'98	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'87	0	Dec:		-
'91	0			-
'94	20			-
'98	60			-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Rosa woodsii																		
S	87	3	-	-	-	-	-	-	-	-	3	-	-	-	200			3
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	98	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
Y	87	14	1	-	-	-	-	-	-	-	14	1	-	-	1000			15
	91	4	-	-	-	-	-	1	-	-	5	-	-	-	333			5
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	98	7	-	-	-	-	-	-	-	-	7	-	-	-	140			7
M	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	91	1	1	-	-	-	-	-	-	-	2	-	-	-	133	22	6	2
	94	1	-	-	-	-	-	-	-	-	1	-	-	-	20	-	-	1
	98	2	4	-	-	-	-	-	-	-	2	4	-	-	120	9	9	6

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	07%	00%	00%	-53%
'91	14%	00%	00%	-96%
'94	00%	00%	00%	+92%
'98	31%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	1000	Dec:	-
	'91	466		-
	'94	20		-
	'98	260		-

Symphoricarpos oreophilus																		
S	87	4	-	-	-	-	-	-	-	-	4	-	-	-	266			4
	91	-	-	-	-	-	-	1	-	-	1	-	-	-	66			1
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	98	24	-	-	-	-	-	-	-	-	24	-	-	-	480			24
Y	87	34	22	1	-	-	-	-	-	-	57	-	-	-	3800			57
	91	60	1	-	-	-	-	1	-	-	62	-	-	-	4133			62
	94	93	-	-	-	-	-	-	-	-	93	-	-	-	1860			93
	98	106	1	-	3	-	-	-	-	-	110	-	-	-	2200			110
M	87	19	17	-	-	-	-	-	-	-	36	-	-	-	2400	14	14	36
	91	77	2	-	3	-	-	1	-	-	83	-	-	-	5533	11	10	83
	94	332	4	-	-	-	-	-	-	-	336	-	-	-	6720	10	14	336
	98	198	6	-	-	-	-	-	-	-	204	-	-	-	4080	12	17	204
D	87	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	91	2	-	-	-	-	-	-	-	-	1	1	-	-	133			2
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'87	42%	01%	00%	+37%
'91	02%	00%	00%	-12%
'94	.93%	00%	00%	-27%
'98	02%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'87	6200	Dec:	0%
	'91	9799		1%
	'94	8580		0%
	'98	6280		0%